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SCIENTIFIC LITERATURE.

Catalogue des bibliographies géologiques. Rédigé, avec le concours des membres de la Commission bibliographique du Congrès. Par EMM. DE MARGERIE. Paris, Gauthier-Villars et Fils. 1896. Pp. xx + 733.

The International Geological Congress, at its Washington meeting in 1891, appointed a standing committee on bibliography. The original membership was ten, but provision was made for enlargement by the committee itself, and there were eventually fourteen members, representing the principal countries or regions having geologic literature. North America was represented by Mr. Gilbert, and South America by Dr. Steinmann, of Freiburg, Baden. The duties of the committee, as instructed by the Congress, were : (1) to prepare and publish a list of existing partial bibliographies of geology ; (2) to promote the preparation by geologic societies and surveys of bibliography pertaining to their respective territories, and (3) to study the problem of the systematic centralized publication of the current bibliography of geology. The first of these works was immediately undertaken and has resulted in an imposing volume of 750 pages.

When a cooperative work of such magnitude is carried to a successful conclusion there is usually some one individual to whose skill and energy the success is due, and in this instance that person was M. Emm. de Margerie, of Paris, the Secretary of the Committee. Under his guidance the other members of the committee gathered material from their respective countries or districts, but the whole was classified, unified, and eventually in large part verified through comparison with original sources by him. He, moreover, made a systematic search of libraries and was thereby enabled to make large additions to the list.

The whole number of entries is 3,918 and these are grouped under two 'parts' and many headings. The first part, with various subdivisions, includes bibliographies whose geographic scope is either the whole earth or one of its greater divisions. The second part includes the bibliographies of regions or countries, arranged alphabetically by regions. The regional entries are also classified according to scope and subject, and there are abundant of cross refer-

ences. This elaborate classification adds greatly to the convenience of the book, enabling the user to find in one place, or at most in two or three places, all references to any special subject of inquiry. His convenience is further consulted by the addition of three indexes, referring severally to authors, places and topics. The scope and method of each work listed, when not described in its title, are explained in the annotation.

A summary of the part pertaining to North America (United States and Canada) will at once illustrate the scope of the list and its mode of classification. General bibliographies afford 12 titles; catalogues of publications of official surveys, 33; general indexes of transactions and journals, 10; annual bibliographies, 9; library catalogues, 3; personal bibliographies and biographic notices, 51; bibliographies of special districts, 61; subject bibliographies, 70, of which 52 pertain to special formations, 1 to paleontology and 9 to petrography.

While the primary purpose of the committee was to take an account of stock in the field of geologic bibliography, and thus pave the way for the most intelligent undertaking of systematic and comprehensive work for the future, their catalogue has an immediate value to the investigator as a directory to the places where the literature he wishes to examine is listed.

The chief cost of publication was met by the local committees of the Washington and Zurich Congresses, and copies of the volume have been forwarded to the geologists who attended those meetings. This distribution has not entirely exhausted the edition, and the remaining volumes are placed on sale, the price for the United States and Canada being \$5.00. The Secretary of the Washington Congress permits me to add that the *Compte Rendu* of that meeting will be forwarded without cost to the American purchasers of the Catalogue. Correspondence should be addressed to

GEOLOGICAL SURVEY,
WASHINGTON, D. C.
G. K. GILBERT.

The Principles and Practice of Teaching. JAMES JOHONNOT. Revised by SARAH EVANS JOHONNOT. International Education Series, Vol. XXXIX., 12mo., pp. xx + 334. D. Appleton & Co., New York. 1896.

Nature Study and Related Subjects for the Common Schools. WILBUR S. JACKMAN, A. B. Part I. Charts, 4to, pp. 23; Part II., Notes, 12mo., pp. 167. The Author, Chicago. 1896.

These two books are of especial interest to teachers of science, for, even though the first is concerned with teaching in general, the author, nevertheless, lays especial stress upon the proper methods of science teaching. Although *Johonnot's* book originally appeared nearly twenty years ago, this revised edition seems fresh and new, not because there is much new matter incorporated in it, nor yet because the subject-matter has been materially changed, but rather because the original work contained so much that was true in principle and clear in expression. The system is based upon sound psychological principles and the book is a clear exposition of the scientific method of teaching. It contains chapters upon the general objects of education, the mental powers, objective and subjective courses of instruction, relative value of different branches of instruction, Pestalozzi, Froebel, Agassiz, systems of education compared, physical, æsthetic and moral culture, general course of study, country schools and their organization.

The most noticeable changes made by the reviser are in relation to manual training, moral culture and general courses of study, and are all in the direction of recent pedagogical opinion on these subjects. An appendix is added, giving an account of a school conducted upon the principles advocated by the author. Of his success we may judge from the following extract:

"Our experiment came to an end. Of the various innovations made upon custom each had justified itself. The effort to make character the end of education had more than fulfilled expectation. During the last year not a single case of misconduct was reported to me, nor was the behavior of one of our students criticised by the citizens. We had a reign of influence. The forces that govern conduct came from a growth within of just and kindly impulses. A watchful supervision had always been maintained, but into this had entered no element of espionage. The peculiar character

which the school attained, both on its mental and moral side, was due to the several factors of influence—scientific methods in study, philosophic succession of subjects and a never-ceasing but an apparently *incidental* attention to moral training."

Prof. Jackman's work consists of two parts, the first being a set of ten charts presenting a conspectus of nature study for the school year, and the second a series of notes and directions for the guidance of the teacher. The charts outline the subjects of study appropriate for each month of the school year from September to June inclusive, the subjects themselves being mineralogy, geology, astronomy, meteorology, chemistry, physics, geography, botany and zoology. Each subject is considered in the two aspects of thought work and form work. Under the former are included the subject, both general and special; the concept, to be considered from the study of the subject; collections illustrating the subject; apparatus required; reading from certain designated books containing selections for school use; literary treatment of the topic by recognized writers; the moral and æsthetic culture derived from the study. Under the head of form work the pupil's training is directed along the lines of the study of the geometrical form exhibited by the object; number, consisting mainly of statistics gathered by examining a large series of objects and bearing on various points; making or modeling the object or the piece of apparatus used; drawing the same; color, as shown in nature; writing upon some topic suggested by the thought work; language, including the study of descriptive phrases, figures of speech, technical terms, etc.; music, as illustrated by the appropriate school songs; references to standard scientific literature.

This plan of study as outlined above will at once be recognized as that of a teacher who has had long experience and has been guided by correct principles; of one who evidently believes that nature study develops something more than the powers of observation, and if properly conducted may be the means of cultivating all the mental faculties. The plan itself is exceedingly comprehensive and varied. In the hands of a conscientious and well-trained

teacher it ought to give admirable results. Each subject is considered from so many points of view that it seems scarcely possible that the pupil could lose interest in the work or fail to see the intimate relation between the great number of natural phenomena and the daily affairs of life. The pupil's attention is held throughout the course of study by interesting him in some aspect of nature especially noticeable during the different seasons. To illustrate, the plan contemplates the following subjects for study during the month of October: In zoology, the migration of animals; in botany, the distribution of seeds; in geography, areas of crops sown in the autumn; in physics, evaporation and condensation; in chemistry, ash, organic matter, fluid and dry solid in common fruits; in meteorology, rainfall and humidity; in astronomy, distribution of sunshine; in geology, erosion and sedimentation, the transporting power of water; in mineralogy, evaporation of water from the soils, and sand and granite.

The notes composing Part Two of the work, though, perhaps, rather too rhetorical in treatment, present to the teacher directions for the construction and use of apparatus, descriptions of experiments and suggestive examples illustrating the tremendous scale upon which the operations of nature are conducted. While in most cases the directions are sufficiently explicit, much is left, and properly, too, to the individual teacher to plan and execute as circumstances may require.

Few teachers realize how much can be made of nature study if properly conducted, and, as Prof. Jackman's plan does not require for its execution that the teacher shall be specially trained in the sciences, it is hoped that it may be widely adopted.

CHARLES WRIGHT DODGE.

UNIVERSITY OF ROCHESTER.

Papers presented to the World's Congress on Ornithology. Edited by MRS. E. IRENE ROOD, under the direction of DR. ELLIOTT COUES. Chicago. 1896. 8vo. Pp. 208. \$5.00.

The 'Congress' at which were presented the twenty-seven papers printed in this volume took place in Chicago in October, 1893. Invi-

tations to it had been widely distributed, signed by a committee of nearly a dozen persons, of whom Dr. Coues is the only one well known as an ornithologist. In the invitation it was announced that the congress was to 'treat of birds from the standpoint of the scientist, the economist and the humanitarian,' and the scientist was warned that the audiences would be characterized by 'æsthetic feelings and humane sympathy rather than intellectual apprehension.' Under these circumstances it is not surprising that the papers show a very wide range of merit, nor that among their writers there are but few ornithologists of much prominence.

Several of the articles are deserving of cordial praise. Mr. D. P. Ingraham, for instance, gives a very interesting account of the American Flamingo, a bird that few other naturalists have seen within the limits of the United States, where to-day it is restricted to the inaccessible, shallow bays of the extreme southern coast of Florida. Another valuable contribution is that on the changes of habits of some birds in Maine, by Manly Hardy, whose many years of exceptionally careful observation have enabled him to narrate a number of instances of adaptation to changed conditions. Somewhat comparable with Mr. Hardy's notes are those of Mr. J. H. Bowles, upon instinct in birds, though of less importance, for the reason that reliable facts of this sort are far more readily attainable than such as Mr. Hardy's, which, from the nature of the case, are seldom afforded save by the life-long experience of a single observer.

The late John S. Cairns contributed a short sketch, giving a good account of the breeding haunts of the Black-throated Blue Warblers on the mountains of western North Carolina. In mentioning the fact that in the spring these birds are already engaged in nest-building at a time when northern-bound individuals of the species are still migrating through the valleys below, he incidentally referred to them as a 'local race.' This calls forth the following editorial foot-note: "As this subspecies does not appear to have been named, it may be called *Dendroica cerulescens cairnsi*.—E. C." Readers of the book may be interested to learn